

# DISTINGUISHED SCIENTIST SEMINAR SERIES

Friday  
August 28, 2015  
10:30 a.m.-12:00 noon  
Building 66 Auditorium  
Lawrence Berkeley National Laboratory  
Host: Seiji Nakagawa

## The Case for Game- Changing Changes for Hydraulic Fracturing



### Sidney Green

Research Professor, University of Utah

Sidney Green is a retired Schlumberger Senior Staff Member and a founder and former President of TerraTek in Salt Lake City, Utah. Mr. Green is also Research Professor at the University of Utah, where he holds an appointment in Mechanical Engineering. Mr. Green has a BS and an MS in Mechanical Engineering; he attended the University of Pennsylvania graduate school, and received the degree of Engineer in Engineering Mechanics from Stanford University. He has worked in the area of geomechanics for over five decades, and has published numerous papers and reports, holds a number of patents, has given many presentations on geomechanics, and has received a number of rock mechanics / geomechanics recognitions. He is a Fellow of the American Rock Mechanics Association, and is a member of the US National Academy of Engineers. He is currently President/CEO of a company he has founded, Enhanced Production, Inc. in Salt Lake City, Utah.

#### Abstract

Hydraulic fracturing for production stimulation of gas/oil recovery is more than important, it is absolutely essential. However, improvements in recovery rate are required for both economic benefit and for reduced environmental impacts. Improvements are being made, but not on the scale of drilling, which has drastically improved in the past decade. Industry now perceives that the great scatter in well production--within essentially every play--is due at least to a large extent to inefficient hydraulic fracturing treatments. In turn, the rock variability seems to lead to this fracturing inefficiency that gives the production variability, even for identical fracturing treatments for wells close together. Something is not measured or not understood about the formation rock behavior. The presentation highlights the role of formation heterogeneity, particularly discontinuities such as bedding interfaces, natural fractures, inclusions, and the like.

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